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from such a sexual intermingling of the forms in question. But the real objection to the theory—granting the possibility of hybridization on such a gigantic scale, which seems really improbable—is, that widely different forms occur also at different points in latitude, between which each successive stage of gradual differentiation can be readily traced, where hybridity can scarcely be supposed to account for the gradual change. Furthermore, gradual differentiation is now known in so many cases that it amounts to the demonstration of climatic variation as a general law, by means of which a species may be safely predicted to take on a given character under certain specific climatic conditions. If the theory of hybridity be urged to account for the intergradation of forms occurring at localities differently situated in respect to latitude, as has sometimes been done, it evidently falls under the weight it has to support; and yet there seems to be little better evidence in its behalf in cases where the intergrading forms happen to be differently situated in respect to longitude.

To describe in detail, or even to give illustrations, of geographical modification would require more space than would be proper to use in this connection, especially since a preliminary exposition of the facts upon which the preceding generalizations have been based, has already been presented in two papers in the *Bulletin of the Museum of Comparative Zoology* (Vol. ii, No. 3, April, 1871, and Vol. iii, No. 6, June, 1872).

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## REVIEWS AND BOOK NOTICES.

RECENT PUBLICATIONS ON ORNITHOLOGY.—Like the pages of the *NATURALIST* with which our readers are of course sufficiently familiar, recent issues of nearly all our scientific institutions show notable activity in ornithology, and a number of papers have accumulated on our table. In the Philadelphia Academy's Proceedings, Mr. Thos. G. Gentry has described peculiarities in the nidifications of *Sayornis fuscus* (1873, p. 292) and *Vireo solitarius* (*op. cit.*, 354); Mr. B. R. Hoopes has published a new variety, *Krideri*, of *Buteo borealis* (*op. cit.*, 238, pl. 5) from Iowa, a pale race of the dry interior, apparently as distinct as some others now currently recognized. In the Boston Society's Proceedings (xvi,

1873, 106), Dr. Brewer has continued the development of Lt. Bendire's Arizona oölogical collections, which was begun in the *NATURALIST* (June, 1873, 321) describing several varieties or novelties. The identifications appear to be correct, excepting that of *Carpodacus Cassinii* which should, we believe, stand as *C. frontalis*, and that of "*Myiadestes Townsendii*," an evident slip of the pen for *Phænopepla nitens*.

Dr. Brewer has also a brief notice of the North American *Hylocichlæ* (Pr. B. S. N. H. xvi, pt. ii), in which he takes the ground that there are eight species of this subgenus, a view at variance with that now commonly accepted by ornithologists, who reduce the number to four or five. For ourselves, we concur more nearly with the mode in which the several forms are handled in the late work of Messrs. Baird, Brewer and Ridgway.

The important business of cataloguing the Boston Society's collection of birds, ably begun by Mr. A. Hyatt, has been carried on by Mr. R. Ridgway, who has gone carefully over the series of *Raptores*, identifying the specimens and naming them upon his protracted and favorably known studies of this group. His paper (Pr. Bost. Soc. xvi, 1873, 43), though simply a catalogue, becomes at once an authority, and places the collection upon a more satisfactory basis than it has hitherto rested upon. We wish that arrangements could be made for him to go over the Philadelphia Academy's *Raptores* in like manner; it is a very desirable piece of work, which must be done some day, and we know of no one more competent to do it. The article is supplemented with monographs of the genera *Micrastur*, *Geranospiza*, *Rupornis* and *Glauucidium*, worked out with the same patient care and to the same extent of analytical detail which have marked his previous labors. Without here entering upon a criticism of certain determinations, as some of those in the genus *Micrastur*, which will require remodelling, we may witness the extent and importance of his investigations in these groups.

The same author has lately cleared his desk of several additional papers, giving as the benefit of much study, the results of which are only now become apparent. The most notable of these (*Essex Inst. Bull.* v, 197) describes a number of new forms of North American Birds, from his own and Prof. Baird's manuscripts. The descriptions are virtually of one parcel with those lately published in the *NATURALIST*, in advance of the great work

of Messrs. Baird, Brewer and Ridgway, partly in courteous accommodation of ourselves, in order that the names might become available for our "Check List," then in press. Some twenty-five new names are proposed all together, mostly varietal.

Mr. Ridgway's fourth and fifth papers are local lists of the Birds of, respectively, Colorado and the Salt Lake Valley. The first of these is a digest of the previous literature upon the subject, together with the large amount of material gathered by, more particularly, Mr. C. E. Aiken; it comprehends the birds of the whole territory. The last named may be regarded as in some measures complementary to Mr. J. A. Allen's recent 'Reconnaissance' (Bull. Mus. Comp. Zool., iii, 1872), Mr. Ridgway's investigations having been conducted from May until August, while Mr. Allen's were autumnal. The two together go very far towards completing our knowledge of the presence and movements of the species within the region mentioned.

In evidence of the great activity of research at present in the southwest, may be instanced an additional local list by Mr. H. W. Henshaw, giving a résumé of the ornithological results of his season's connection with the Wheeler Explorations west of the 100th meridian. The ground covered is partly what we went over in 1864-65, which has been latterly reworked by Lt. Bendire, U.S.A. The list is confined to Mr. Henshaw's own observations, and may be regarded as perfectly reliable, not only in the identifications of the species, now contained in his beautiful collection, but in the observations upon their movements and relative frequency.

Returning to Mr. Ridgway's contributions to ornithology, we have next to note an important paper (Ann. Lyc. N. Y. x, 1874, 364) upon the birds of Illinois, with one exception the first article bearing upon the whole subject. Mr. R. H. Holder's paper (Trans. Ill. Agric. Soc. iv, 1859-60, 605; 247 species, minus two not valid) was a simple enumeration, and, though excellent as far as it went, lacked the essential qualifications of discriminating the several categories of residents, migrants and stragglers. Kennicott's contributions (*op. cit.*, i, 580; 187 species) were confined to Cook county, and to a supplement of 22 species to Henry Pratten's list of the Birds of Wayne and Edwards counties (184 sp. + 22 = 206; *op. cit.*, 596) with the addition of *Plotus anhinga* and *Tantalus loculator* (Pr. Bost. Soc. v, 1856, 391). With the exception of a paper which we have not seen, by F.

Brendel (Giebel's *Zeitsch.* 1857, 420), and Mr. Allen's Notes on the Birds of Northern Illinois (Mem. Bost. Soc. i, 1868, 502; 94 species), no other formal papers on the subject have appeared to our knowledge, though Mr. Ridgway himself has twice communicated short pages to the *NATURALIST* (vi, 1872, 430; 4 rare species; and Apr., 1873). The present list, occupying thirty pages, gives 311 species certainly occurring, with 43 "probabilities," representing a total of nearly 350 species, constituting the probable avifauna of the state. Of these 176 are known to breed. The two families, *Sylvicolidae* and *Fringillidae*, head the list with no fewer than 36 species apiece. The *Anatidae* follow with 34, the *Scolopacidae* with 25, and the *Falconidae* with 20. Sixteen families have but a single Illinois representative; the remainder average about five species to a family. All the North American families excepting *Chamaeidae*, *Procellariidae* and *Alcidae* occur in the State. Among the breeders, the *Sylvicolidae* and *Fringillidae* are as before best represented with respectively 21 and 16 species. Lake Michigan furnishes a large quota of the stragglers, among waders and swimmers. Several species occur not hitherto attributed to the State, and the number of rarities is quite large. Being based upon personal observations, as well as upon a command of the published literature of the subject, and possessing the best qualities of a local list, the present paper at once becomes the authority, superseding the previous incomplete records. We notice considerable nomenclature to which we are unaccustomed, but this matter scarcely requires criticism in a paper having no special classificatory object; though we must demur at what seems to us, in some instances, a forced reduction to varieties of accredited species upon some theory, perhaps, of varietal relations with European forms whose intergradation with ours remains to be proven. It is unsafe to presume in such cases, or even to argue from analogy; nor can we say, at present, that a certain amount of observed difference shall be held specific, and another amount only varietal; we want to see the links.

We have an ornithological paper from a comparatively new quarter, by a writer of whom we have not before learned in such connection. In preparing a Report on the Birds of Minnesota (Bull. Minn. Acad. Nat. Sc. i, 1874, 50) Dr. P. L. Hatch does not appear to have availed himself of Mr. T. M. Trippe's late Communication (Bull. Essex Inst. vi, 1871, 113), nor of Dr. J. F.

Head's earlier article (Smith. Rep. 1854, 291). The list includes 230 species, being thus more nearly complete than either of its predecessors, one of which gave 60, the other 138. This number is so near the presumed maximum, that on casually looking up the subject from our own notes we find only about 20 species to be added. Still fewer species should be erased, though there are several we regard as uncertainties, like *Contopus Richardsons* and *Empidonax pusillus*, while others, as *Archibuteo Sanctijohannis* (given in addition to *lagopus*) and *Nyctale albifrons*, are purely nominal. As usual with scientific printing in a new place, typographical errors are too frequent. It is the most satisfactory enumeration of the birds of this state we have had, while its value as a mere catalogue is much increased by the running commentaries, giving items on the period of occurrence, breeding, relative numbers, etc., of the species, as well as, in many instances, brief notes of habits.

We have not yet reached the number of the faunal lists before us. A long expected paper of great consequence has just appeared in the Memoirs of the Boston Society (ii, 1874, pt. iii, No. II, pp. 265-319); we refer to Mr. G. N. Lawrence's "Birds of Western and Northwestern Mexico." This is based upon the manuscripts and collections of the late Col. A. J. Grayson, of Mr. J. Xantus and Mr. F. Bischoff, placed by the Smithsonian Institution in Mr. Lawrence's hands for elaboration. The collections together represent 316 species, of which not a few were novelties, recently described by Mr. Lawrence, in the Annals of the New York Lyceum and the Proceedings of the Boston Society. The largest and most valuable were made by Col. Grayson, chiefly in the vicinity of Mazatlan. The paper is enriched with copious field notes, Col. Grayson having intended to prepare a full history of the Birds of Western Mexico, with many colored plates of life size — an enterprise most unfortunately cut short by his lamented death. Mr. Lawrence observes that "as a field naturalist he should take rank with Audubon;" and presents extracts of his writings, "exceedingly graphic and of great value, as they elucidate the economy of many species, of which, comparatively, but little was heretofore known." We trust it may not be long before Mr. Lawrence will further elucidate the ornithology of Mexico, with the results of his examination of Sumichrast's Tehuantepec collections, upon which he has been engaged.

Messrs. Jordan and Van Vlieck publish at Appleton, Wisc., in small 4to, a Popular Key to the Birds, Reptiles and Fishes of the Northern States. When the emended edition of this praiseworthy endeavor to unlock this portion of our fauna to students is issued — we understand a revision is contemplated — we trust we may be authorized by the merits of the publication to speak of it more highly than we can at present.

Though somewhat foreign to our present purpose, reference in this connection to Prof. Reinhardt's continued studies on the osteology of Water-birds (Aft. Vid. Medd. Nat. For. Kjöb., 1873, 123) may not be wholly out of place, as we are convinced of the particularly important bearing such investigations have upon the classification of the future. In the late paper referred to, the wing-structure of Procellariidæ is treated with reference to the presence of the one or two supplementary ossicles of the elbow-joint, developed in connection with the "apophyse crochue" of the humerus, and the origin of the *extensor metacarpilongus* and *extensor plicæ alaris* (*tensor patigii* of some authors). He finds the bones in six genera and not in eight; but as the six are the richer in species, it is present in about two-thirds the species of the family. They are peculiar to the family, though other *Longipennes*, as well as *Alcidæ* and *Limicolæ* have the humeral hook. He points out their function, and proposes to divide the group primarily upon them. — ELLIOTT COUES.

HISTORY OF NORTH AMERICAN BIRDS.\*—The announcement of a work on the ornithology of North America, by the above-named gentlemen, is in itself a guarantee of its interest and scientific value; and the three volumes now published fully satisfy such expectations.

A work of this character, always welcome, is particularly opportune at this time, as the need of a comprehensive "History of North American Birds" has long been felt. For nearly a third of a century from the publication of Audubon's "Birds of America," in 1844, until the present year, no such book has appeared.† As long ago as 1858, the numerous Government expeditions had ac-

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\* A History of North American Birds, by S. F. Baird, T. M. Brewer and R. Ridgway. Land Birds. 3 vols., large 8vo. Boston, Little and Brown.

† We exclude numerous monographs and more or less local lists; and also certain works, which, while valuable in themselves, contain little or nothing in regard to general and breeding habits.